

EX PARTE OR LATE FILED

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Washington, DC 20005



April 10, 1997

EX PARTE

William F. Caton
Acting Secretary
Federal Communications Commission
Mail Stop 1170
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Dear Mr. Caton:

Re: CC Docket No. 96-262 - Access Charge Reform
CC Docket 96-45 - Universal Service

The attached information is provided in response to three Commission information requests that arose during Pacific Bell's ex parte meetings of March 14 and 15. This material describes:

- the Commission's obligation to ensure revenue neutrality,
- why selective pricing as we have proposed is not anticompetitive, and
- a comparison of actual vs. forecasted stimulation resulting from rate rebalancing in California.

This material was delivered today to Dan Gonzalez, Tom Boasberg, Jim Coltharp, Jim Casserly, Joseph Farrell, Jane Jackson, Kathleen Levitz, Greg Rosston and John Nakahata. We are submitting two copies of this notice in accordance with Section 1.1206(a)(1) of the Commission's rules.

Please stamp and return the provided copy to confirm your receipt. Please contact me at (202) 383-6429 should you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Jay Bennett".

Attachment

No. of Copies rec'd
List ABCDE

041

cc: D. Gonzalez, T. Boasberg, J. Coltharp, J. Casserly, J. Farrell, J. Jackson,
K. Levitz, G. Rosston, J. Nakahata

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APR 10 1997

Federal Communications Commission
Office of Secretary

Recently, representatives from Pacific Bell met with various members of the Common Carrier Bureau and other Commission staff on our position on access reform and universal service. Various issues surfaced at those meetings where Pacific was requested to submit additional information and analysis in the record of CC Docket 96-262. We address three issues: 1) the Commission's obligation to ensure revenue neutrality; 2) why selective pricing is appropriate and is not anticompetitive; and 3) a history of toll and access pricing changes in California and their elasticities.

(1) Commission Obligation to Ensure Revenue Neutrality

Pacific believes that the Commission has a responsibility to recognize and permit the recovery of the costs that its rules assign to the interstate jurisdiction. Jurisdictional separation rules, duly adopted by the Joint Board, dictate that we assign a particular percentage of costs to the interstate jurisdiction. We then set rates to cover those costs. While price cap regulation divorces prices from costs (at least when sharing is not involved), cost allocations continue to be mandated and relevant for 2 reasons. First, for both the Subscriber Line Charge, and the Carrier Common Line Charge (CCLC), separations rules result in costs allocated to the interstate jurisdiction. SLCs are determined based on a forecast of interstate allocated costs and demand. CCLC is calculated from the residual left after the residential end user rate is capped. Thus, for these rate elements, interstate-allocated costs continue to actively drive prices. For other access elements, such as TIC and local switching, separated costs, upon which price caps were instituted, continue to be relevant and constitutionally protected from confiscation. Until and unless a joint board is convened pursuant to section 410(c) of the Act, and the states agree to permit recovery of actual costs, the Commission must continue to permit recovery of all interstate-allocated costs.

Even the principle of revenue neutrality has limits. The Commission may not require carriers to institute an entirely new set of subsidies -- the education, library and health care funds -- and still adhere to the principle of revenue neutrality. Rather, carriers must be permitted to recover the cost of their contributions to these programs in the form of a surcharge.

Second, price cap regulation may not result in confiscation under the Fifth Amendment. The Fifth Amendment requires a utility to be permitted a rate that will allow it to "maintain its financial integrity, to attract capital, and to compensate its investors for the risk [they have] assumed."¹ As Justice Scalia explained in Duquesne, since the Constitution requires that a utility be allowed a "fair return on investment", whatever method maybe used in setting the rate, in judging the ultimate effect of the rates set by that method, there must be some minimum measure of the investment against which returns may be judged to be "fair." Duquesne 488 US at 317 (J. Scalia, concurring). And, under the Constitution, "all prudently incurred investment may well have to be counted." *Id.*, see also Duquesne 488 US at 310.

¹ Duquesne Light Co. v. Barasch, 488 US 299 (1989) (quoting FPC v. Hope Natural Gas Co., 320 US 591, 605 (1944)).

At NARUC a few weeks ago, Chairman Hundt postulated that the LEC is not necessarily guaranteed as a matter of law a complete certainty of recovering all historic investment.

"Takings is certainly one of our concerns here, but we must not forget "givings"" He went on to mention three: "giving the LECs cellular licenses, giving LECs yellow pages publishing opportunities, and giving LECs the opportunity to enter long distance." However, as a matter of fact, and a matter of law, these givings cannot be used to offset a taking that may result from FCC regulations or orders.

Legally, "givings" cannot be considered an offset to an unconstitutional taking. The Commission, in setting rate orders may not justify unreasonably low rates on one aspect of a carrier's business by relying on revenues from other activities to subsidize the loss. It is well settled that a partially regulated entity cannot be required to operate the regulated segments of its business at a loss on the theory that profits from its competitive activities may compensate for confiscatory rates.²

"Where competition prevails, a firm cannot compensate itself for losses on one venture by raising prices on other lines of business; if it tried to do so, competitors could profitably capture the business."³ The Commission must determine the fair return on regulated assets and therefore rely only on income from regulated assets to determine whether the opportunity for a fair return exists.

The Commission itself has recognized that it may not use profitability in an unrelated segment of the business to offset a potential regulatory taking. In connection with its decision in Local Competition, the Commission analyzed its responsibilities with respect to takings issues and concluded that Hope Natural Gas requires that the "end result of our overall regulatory framework provides LECs a reasonable opportunity to recover a return on their investment. In other words, incumbent LECs' overall rates must be considered, including the revenues for other services under our jurisdiction."⁴ The Commission noted, however, that it "*may not consider incumbent LEC revenues derived from services not under our jurisdiction*," citing to Smith v. Illinois Bell, 282 US 133 (1930). Local Comp n. 1756. Thus, not only may intrastate revenues not be considered under a takings analysis, but revenues from unregulated lines of business may similarly not be considered. Thus, cellular revenues and yellow page revenues cannot be used to excuse a Commission action which results in a taking.

² See, Brooks-Scanlon Co. v. Railroad Commission, 251 US 396 (1920); see also Norfolk & W. Ry Co. v. Conley, 236 S 605, 609 (1915).

³ Associated Gas Distributors v. FERC, 824 F.2d 981, 1034 (D.C. Cir. 1987).

⁴ *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, 11 FCC Rcd 15499 (1996), para 737; *petition for review pending and partial stay granted, sub nom. Iowa Utilities Board v. FCC*, No. 96-3321, and consolidated cases (8th Cir., 1996).

(2) Selective Pricing, As We Have Proposed, Is Not Anticompetitive

Pacific Bell has requested, as part of Phase I relief, to be able to use contract based tariffs, as well as further term and volume discounts for its access services. Some concerns have been raised that such pricing is not appropriate at the present time. We will show that such pricing strategies are very timely, and fully in conformance with antitrust law and policy.

Antitrust policy does not require that Pacific Bell price its services well above its costs in order to protect less efficient competitors. In fact, antitrust policy requires the opposite result -- i.e., an order permitting Pacific Bell to use volume and term discounts and special contracts to price its services as closely to cost as possible. This is the correct outcome *even if* Pacific Bell could properly be characterized as a "monopolist" in the market for exchange access services (which it cannot)⁵ and *even if* Pacific Bell's discounts cause competitors to postpone their entry into the market.

It can't be said often enough that the antitrust laws protect competition *not* competitors. As we noted earlier, competition is essential to the operation of a free market because it encourages efficient, promotes consumer satisfaction and prevents the accumulation of monopoly power. When a producer is shielded from competition, he is likely to provide lesser service at a higher price; the victim is the consumer who gets a raw deal. This is the evil that the antitrust laws are meant to avert. *But when a producer deters competitors by supplying a better product at a lower price, when he eschews monopoly profits, when he operates his business so as to meet consumer demand and increase consumer satisfaction, the goals of competition are served, even if no actual competitors see fit to enter the market at a particular time. ...*

If a dominant supplier acts consistent with a competitive market -- perhaps out of fear that potential competitors are ready and able to step in -- the purpose of the antitrust laws is amply served. We make it clear today, if it was not before, that an efficient vigorous, aggressive competitor is not the villain antitrust laws are aimed at eliminating. Fostering an environment where businesses fight it out using the weapons of efficiency and consumer goodwill is what the antitrust laws are meant to champion. U.S. v. Syufy Enterprises, 903 F.2d 659, 668-69 (9th Cir. 1990)(emphasis added).

These principles were applied by the Seventh Circuit Court of Appeals in MCI Communications Corp. v. AT&T, 708 F.2d 1081, 1057 (7th Cir.), cert. denied, 464 U.S. 891 (1983). At the time of that lawsuit, AT&T was unquestionably a monopolist in the market for long distance service and MCI argued that AT&T should be forced to price that service well above its cost of providing it. The Seventh Circuit rejected MCI's argument as "incompatible with the basic principles of antitrust" and went on to observe that:

⁵ As we stated in our meetings earlier this month, Pacific Bell has lost 10% of the Hicap market share in the last year in Los Angeles and San Francisco, bring its market share down to only 55%. In addition, in just the last year, the number of collocation cages doubled to 208, and the number of cross connects grew by 270% from 8300 DS1 equivalents to 30,717.

The ultimate danger of monopoly power is that prices will be too high, not too low. A rule of predation based on the failure to maximize profits would rob consumers of the benefits of any price reductions by dominant firms facing new competition. ***Such a rule would tend to freeze the prices of dominant firms at their monopoly levels and would prevent many pro-competitive price cuts beneficial to consumers and other purchasers. ... It is in the interest of competition to permit dominant firms to engage in vigorous competition, including price competition.*** MCI, supra, 708 F.2d at 1057 (emphasis added; citations omitted).

The Ninth Circuit Court of Appeals reached the same conclusion in Hanson v. Shell Oil Co., 541 F.2d 1352, 1358-59 (9th Cir. 1976), cert. denied, 429 U.S. 1074 (1977). Hanson argued that Shell violated the antitrust laws by cutting its gasoline prices. In analyzing this claim, the court pointed out that:

Hanson made no effort to prove that the prices Shell was charging at either the wholesale or the retail level were below marginal or average variable costs and, for all that appears Shell's new pricing policies were nothing more than an attempt to gain a larger share of the market because of its stronger competitive position. Hanson, supra, 541 F.2d at 1358.

The court went on to reject the proposition that Shell was required to protect a competitor by charging much higher prices than its cost of producing gasoline.

If [Shell's] prices were above its costs, and nevertheless Shell did drive Hanson out of business, this can only be because Hanson was so inefficient that at prices at which Shell could make a reasonable profit [Hanson] could not. ***The antitrust laws were not intended, and may not be used, to require businesses to price their products at unreasonably high prices (which penalize the consumer) so that less efficient competitors can stay in business. The Sherman Act is not a subsidy for inefficiency.*** Id. at 1358-59 (emphasis added).⁶

The FCC rules that prevent Pacific Bell from discounting its exchange access services serve only to protect a group of companies that are not efficient enough to meet or beat Pacific Bell's discounted prices or innovative enough to offer a product that can command premium prices. Since the result is that consumers pay more for services than they should, the existing FCC rules are not consistent with antitrust policy, and should be altered to permit the use of innovative pricing strategies such as further term and volume discounts, and contract based tariffs.

⁶ See also, Janich Bros., Inc. v. American Distilling Co., 570 F.2d 848, 855 (9th Cir. 1977), cert. denied, 439 U.S. 829 (1978)(It is the very nature of competition that the vigorous, efficient firm will drive out less efficient firms. This is not proscribed by the antitrust laws); Arthur S. Langenderfer, Inc. v. S.E. Johnson Co., 729 F.2d 1050, 1056 (6th Cir. 1984)(defendant cannot be found to violate the antitrust laws simply because it was more cost efficient than its competitors and could afford to submit a lower bid).

3) History of toll and access pricing changes in California and their elasticities

Rate rebalancing was adopted by the California Public Utilities Commission (CPUC) in September 1994 and rates were effective January 1, 1995 (per D.94-09-065). That decision ordered that rate rebalancing would be revenue neutral. The CPUC increased monthly residence flat rate service from \$8.35 to \$11.25. Basic business measured service was increased from \$8.35 to \$10.32. Prices for measured local calls decreased from \$0.06 to \$0.054 for a three minute day period call. Overall residence local prices increased by \$260 million while business local prices decreased by about \$4 million. IntraLata toll prices were reduced by \$750 million or 47%. Switched access prices were reduced by \$355 million or 51%. Finally, the CPUC eliminated a surcredit applied to all services that effectively increased prices by \$650 million and made other price changes to achieve a revenue neutral outcome.

The rebalancing decision adopted an elasticity of $-.5$ for toll and $-.44$ for switched access and used a non-linear model to calculate the stimulated demand. (See chart below). The CPUC said it did not consider any other demand changes, either up or down because the record for other services was not sufficient. Increased revenues from stimulated demand were offset somewhat in the decision by recognizing increased costs (TSLRIC) for the stimulated demand. The actual results, however, showed markedly different effects than those adopted by the CPUC. (See chart below). Therefore, in September, 1995 Pacific filed a Petition to Modify the adopted elasticity values. On February 19, 1997, the CPUC denied Pacific's Petition to Modify the elasticity values adopted in D.94-09-065, indicating it would be unfair to examine one element of the decision without examining all elements (D.97-02-049, February 19, 1997). The CPUC also noted that there had been an explosion in the number of access lines in the two years since the decision.

	<i>CPUC ADOPTED VALUES⁷</i>	<i>ACTUAL VALUES⁸ (Data thru 12/95)</i>	<i>ACTUAL VALUES⁹ (Data thru 9/96)</i>
Elasticity:			
Toll	- .50	- .20	- .20
Access	- .44	- .16	- .24 ¹⁰
Increased Volumes:			
Toll	34%	12.8%	15.8%
Access	33%	8.5%	10.9%

Also attached are charts depicting our average access and toll rates over the last few years and what we have recently proposed in our rate rebalancing filing.

⁷ D. 94-09-065, September 20, 1994.

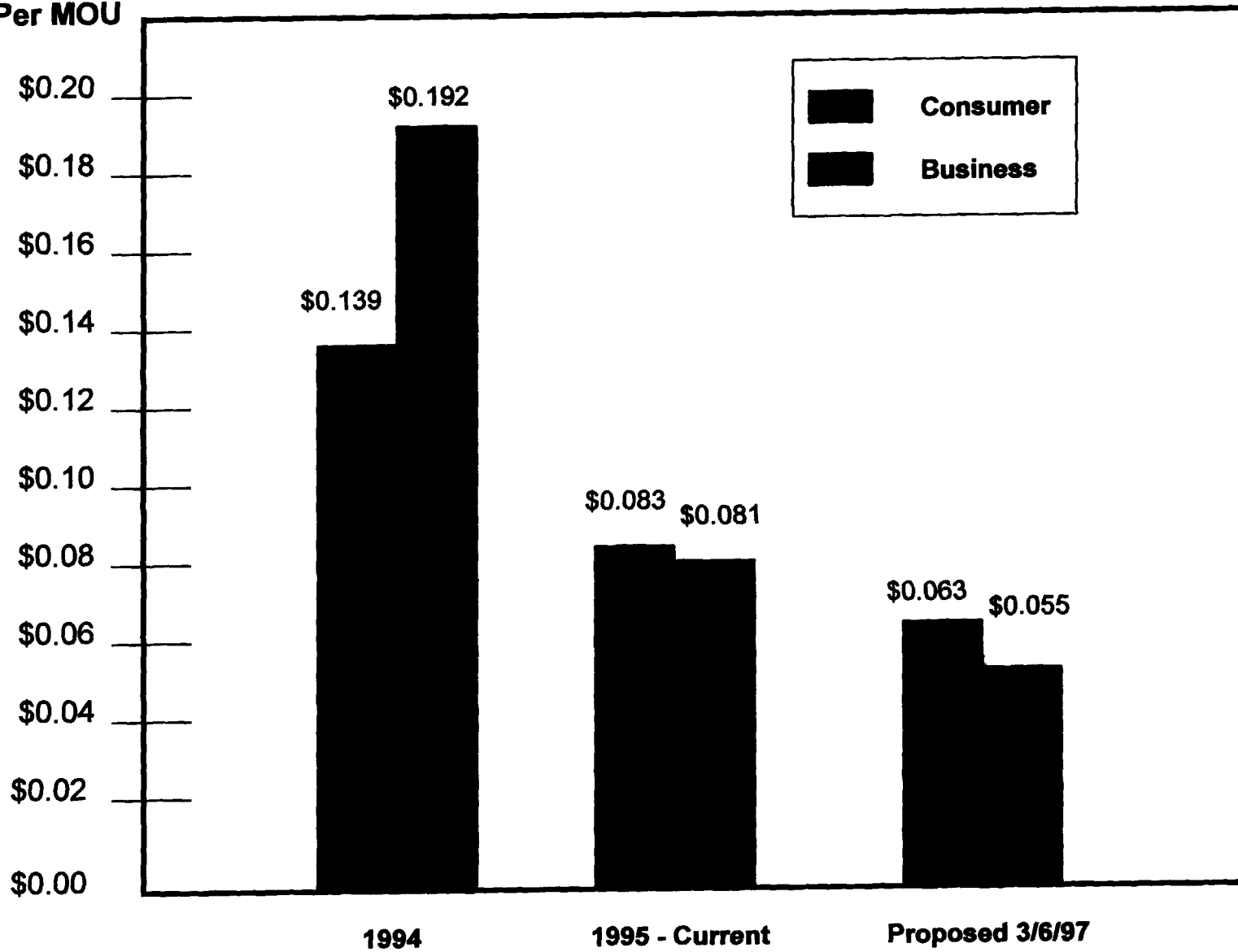
⁸ Petition to Modify D. 94-09-065 as amended January 22, 1996.

⁹ A. 97-003-004 filed March 6, 1997. (State Universal Service Rate Rebalancing Proceeding).
See Testimony of Dr. Timothy J. Tardiff, attached.

¹⁰ Data not normalized for significant, forecasted shift in PIU from interstate to intrastate jurisdiction.

PACIFIC BELL AVERAGE INTRALATA TOLL RATES*

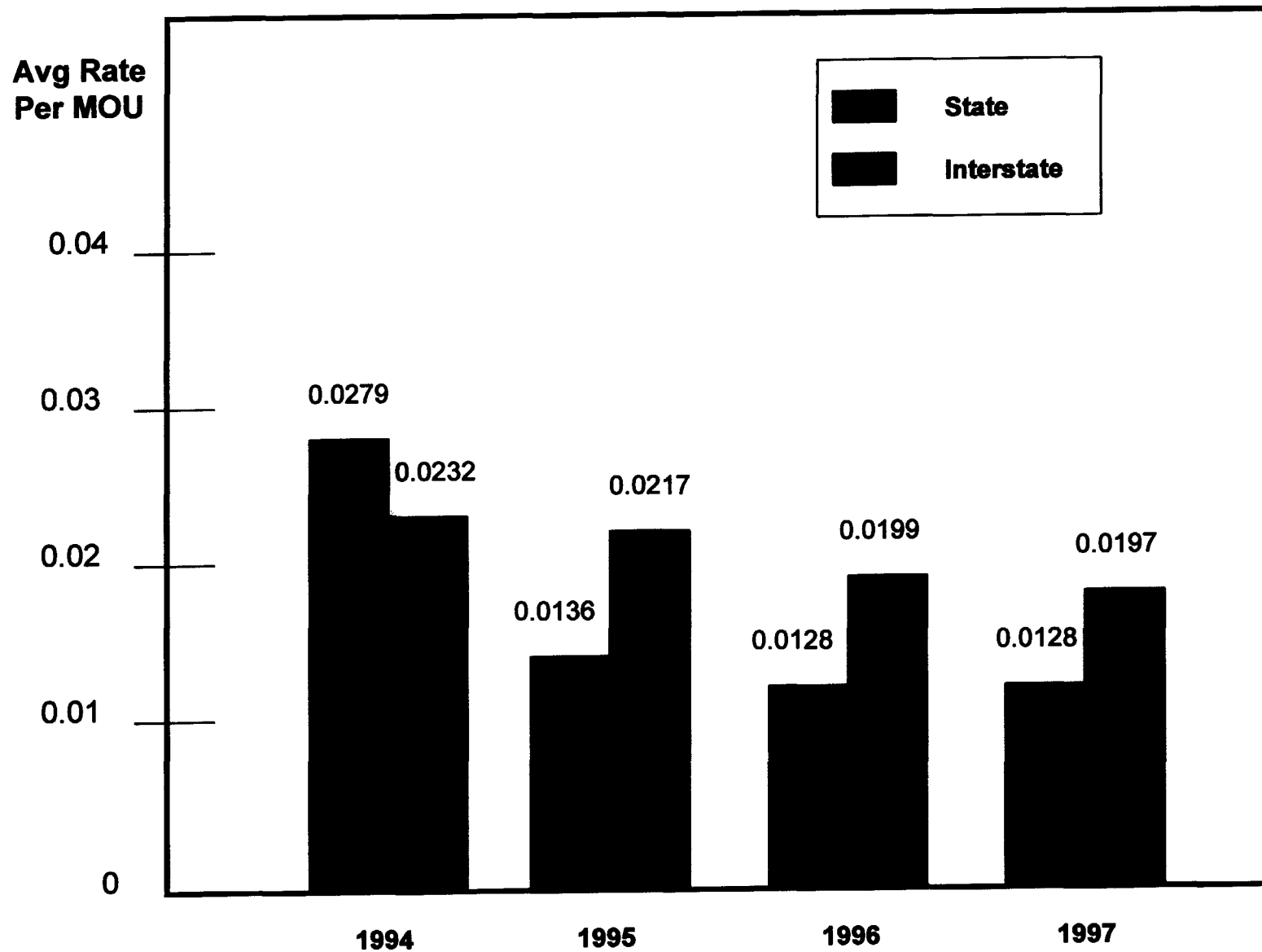
**Avg Rate
Per MOU**



*** Excludes Operator
Handled Calls**

PACIFIC BELL

AVERAGE STATE & INTERSTATE ACCESS RATES



(Filed in
A. 97-03-004
State Universal
Service Rate
Rebalancing)

**BEFORE THE
PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

**TESTIMONY OF DR. TIMOTHY J. TARDIFF ON BEHALF OF
PACIFIC BELL (U 1001 C)**

March 6, 1997

TESTIMONY OF DR. TIMOTHY J. TARDIFF

Q. Please state your name and business address.

A. My name is Timothy J. Tardiff. I am a Vice President at National Economic Research Associates, 1 Main Street, Cambridge, MA 02142.

Q. Please describe your educational and professional qualifications.

A. I received the B.S. degree from the California Institute of Technology in mathematics (with honors) in 1971 and the Ph.D. in Social Science from the University of California, Irvine in 1974. From 1974 to 1979, I was a member of the faculty at the University of California, Davis. I have specialized in telecommunications policy issues for about the last 15 years. My research has included studies of the demand for telephone services, such as local measured service and toll; analysis of the market potential for new telecommunications products and services; assessment of the growing competition for telecommunications services; and evaluation of regulatory frameworks consistent with the growing competitive trends. I have filed testimony on behalf of Pacific Bell before the California Public Utilities Commission in the Open Access and Network Architecture Development (OANAD), Pacific's Petition for Modification of D.94-09-065, and Universal Service investigations. In addition, I co-authored reports that were attached to testimony filed on behalf of Pacific Bell in the 1992 and 1995 incentive regulation review and post-retirement benefits matters. I have also filed testimony and related documents before the Federal Communications Commission and state regulatory commissions in Illinois, New York, Texas, Pennsylvania, Missouri, Oklahoma, Indiana, Massachusetts, North Carolina, Virginia, Kansas, Arkansas, and Kentucky. Attachment 1 is a copy of my resume.

I. INTRODUCTION

Q. What is the purpose of your testimony?

A. This testimony presents elasticities for toll and switched access for use in calculating the demand stimulation that would result from price reductions for these services. Calculation of demand stimulation is a necessary step in calculating how much revenue

changes as a result of a price reduction. In particular, these elasticities should be used to calculate the revenue changes that will accompany Pacific's proposed price changes in this proceeding. My elasticities incorporate the response of California's customers to the large price reductions ordered by D.94-09-065 (IRD Decision). In addition, I discuss why reducing toll prices so that the contribution (price minus incremental cost) is closer to the contribution levels for switched access is beneficial to consumers and promotes efficient competition.

Q. Please summarize the results of your demand study.

A. My study produced elasticities to be applied with the nonlinear demand curve this Commission adopted in the IRD Decision. The elasticities for toll and switched access services are as follows.

Toll services¹: -0.20

Switched Access: -0.24

II. HOW PRICE CHANGES AFFECT VOLUMES: PRICE ELASTICITIES

Q. What typically happens when the price of a product or service changes?

A. When the price increases, consumers typically use less of a product or service. Conversely, when the price decreases, consumers tend to use more of the service. A *price elasticity* is a measure of how large these volume changes are when price changes.

Q. Please define price elasticity.

A. An elasticity measures the percentage change in volume that results from a one-percent change in price.² For example, if price declined by 10 percent and consumers eventually used 5 percent more of the service, the price elasticity would be -0.5 (5%/-10%).

Q. Why is it important to consider volume changes when analyzing the effect of a price change?

¹ Toll services include business and residential message toll service (including discount plans), coin, operator-handled, and calling card services. Business WATs and 800 are not included.

² Technically, an elasticity describes a small price change.

1 A. When the price of a product or service decreases,³ there are two effects on a firm's
2 revenues (and costs). First, the volumes that were consumed before the price change
3 generate less revenue—by the amount of the price reduction. Second, when the new
4 price exceeds incremental cost, the extra volume stimulated by the price change
5 produces net revenue that offsets the first impact to some degree.

6 Q. Please provide an example.

7 A. Suppose customers now use 100 units of a service currently priced at \$1.00 per unit and
8 the corresponding incremental cost is \$0.70 per unit. If price decreased to \$0.90 (10
9 percent), a -0.5 demand elasticity implies that volume would increase by 5 percent to 105
10 units. The two effects described above are the following:

11 Reduced revenue on previous volume: $100 \times (\$1.00 - \$0.90) = \$10.00$

12 New net revenue on stimulated volume: $(105 - 100) \times (\$0.90 - \$0.70) = \$1.00$

13 Combined impact: $-\$9.00 (\$1.00 - \$10.00)$

14 Q. Your example suggests that it is possible to measure an elasticity by measuring the
15 change in volume before and after a price change of a known size. Is this true?

16 A. It would be if (1) nothing else were changing except the price and (2) enough time had
17 gone by for customers to respond fully to the price change, e.g., it may take some time
18 for customers to be fully aware that price has changed. In these ideal circumstances, one
19 would indeed simply measure how much volumes increased as a result of the known
20 price change. Further, the resulting measure of demand stimulation (e.g., suppose one
21 observed that volumes increased by 10 percent as a result of a 50 percent reduction in
22 price) would provide a reliable basis for predicting the impact of a similar future price
23 change.

24 Q. What changes other than price changes cause consumers to change the volumes of
25 service they purchase?

26 A. Over the period of time it takes for consumers to respond to a price change, factors such
27 as income and population may also be changing. Because volumes typically increase as

³ The revenue impact of a price increase is treated similarly.

1 population and income increase, even when price does not change, it is important to
2 separate the volume increases attributable to these non-price factors from the effect of
3 price. For example, the IRD Decision reduced toll prices by about 45 percent. Since
4 that time, factors other than price changed. In particular, the California economy is
5 healthier now than in the period immediately preceding the IRD price changes.
6 Therefore, it is necessary to remove the effects of these other factors in order to
7 determine how much price changes alone contribute to volume growth.

8 III. TOLL DEMAND STUDY

9 Q. What is the purpose of a demand study?

10 A. A demand model explains how consumers increase the volume of a particular service
11 they purchase when the price for that service decreases. A demand model allows us to
12 explain how much of the volume growth is due to price reductions and how much is due
13 to other factors, such as growth in income and population.

14 Q. How does a demand model isolate the unique effect of a price reduction?

15 A. A demand model employs econometric techniques on data in which both volume and
16 price have changed to determine statistically the impact of the price change.

17 Q. What price change did you consider in your demand study?

18 A. My study focuses on the price change ordered by the IRD Decision. This price change
19 provides a particularly rich source of information to assess how California's consumers
20 respond to price changes. In particular, (1) the price change was large by historical
21 standards, (2) it occurred immediately and was well-publicized, so that customers likely
22 became aware of the change in short order, and (3) it was clearly specific to California's
23 consumers.

24 Q. Please describe the data you used to study toll demand.

25 A. I used monthly data on intraLATA toll volumes, toll prices, and real personal income for
26 the period January 1992 to September 1996. The particular variables were as follows.

- 1 • Volume: For 1992 to 1994, Pacific's intraLATA toll volumes for residence,
2 business, and other (calling card, operator-handled, and coin) services.⁴ For the
3 post-IRD period (1995 and 1996), volumes also include other carriers, as measured
4 by intraLATA 10XXX switched access volumes.
- 5 • Price: In Attachment 2, I estimate that the IRD Decision lowered toll prices by 44
6 percent. Prior to IRD, tariffed prices did not change, except for small changes in the
7 surcredit that was in effect then. Similarly, post-IRD prices have not changed, apart
8 from minor changes in a much smaller surcredit. As is customary in econometric
9 demand studies, price is expressed in real (inflation-adjusted) dollars, by dividing by a
10 consumer price index.⁵ In summary, my price variable reflects the large IRD price
11 changes, as well as the much smaller impacts of changes in the surcredit and changes
12 in inflation. Price was entered into the model as a polynomial distributed lag (PDL)
13 to account for the fact that customers require a certain amount of time to respond to
14 a price change.⁶
- 15 • Real Personal Income: To account for changes in the strength of California's
16 economy, I used real personal income for the 1992 to 1996 period, which is
17 calculated by the Bureau of Economic Analysis, US Department of Commerce.
18 Because real personal income is used in its total (as opposed to per-capita) form, it
19 also captures the impact of population growth.
- 20 • Monthly indicator variables: Because toll volumes tend to be seasonal, I included
21 indicator variables in my model.⁷ These indicator variables show by what percentage

⁴ The data are aggregated over these services. Separate volumes for the individual services are not available.

⁵ In particular, I used a weighted average of the CPI for Los Angeles and San Francisco, which is published by the California Department of Industrial Relations.

⁶ My models include a linear PDL with a duration of 12 months. That is, the effect of the price change is largest in the first month and declines over the period of a year. This pattern is consistent with the post-IRD demand stimulation, where volumes jumped quickly, with subsequent growth more modest. I tested other lag structures (second order or quadratic) polynomial and different durations. The linear PDL I selected (1) produced the best statistical fit and (2) generally resulted in about the same or higher long-run price elasticities relative to the other lag structures.

⁷ Indicator variables (also called dummy variables) equal one for the month in question and zero otherwise.

volume in a month, say January, typically differs from volumes in other months, apart from the contributions from price and income.

Q. The IRD Decision specifies that a non-linear demand curve be used when applying elasticities. Is your model consistent with this practice?

A. Yes. Consistent with the demand curve specified in the IRD Decision, I estimated the following equation.

$$\log (\text{volume}) = a_0 + a_{Jan} + \dots + a_{Nov} + a_1 \log (\text{Income}) + a_2 \log (\text{price})$$

In the equation, the coefficients of the monthly indicator variables (e.g., a_{Jan}) measure the percentage difference in demand levels between that month and December.⁸ The coefficient of the income variable (a_1) is the income elasticity and the coefficient of the price variable (a_2) is the price elasticity.⁹

Q. Why is the shape of the demand curve important?

A. For large price changes, the amount of demand stimulation that results from a particular elasticity value depends on the demand curve with which it is applied. In particular, the non-linear demand curve adopted in the IRD Decision produces more demand stimulation than application of the linear demand curve would produce.

Q. Please illustrate this point.

A. Suppose the price elasticity is -0.2 and prices decrease by 50 percent. Figure 1 shows two demand curves with elasticity equal to -0.2 at a volume of 100 and a price of 1. The figure shows that if the price decreases to 50, volume is greater with the non-linear curve. Quantitatively, the volume stimulation from the non-linear model is as follows.

$$\text{Non-linear: } \frac{\text{New Volume}}{\text{Old Volume}} = \left(\frac{\text{New Price}}{\text{Old Price}} \right)^{-0.2} = (0.5^{-0.2}) = 1.15$$

⁸ For example, a coefficient of -0.05 for an indicator variable means that volumes for that month tend to be five percent lower than December volumes (after differences in price and income have been taken into account).

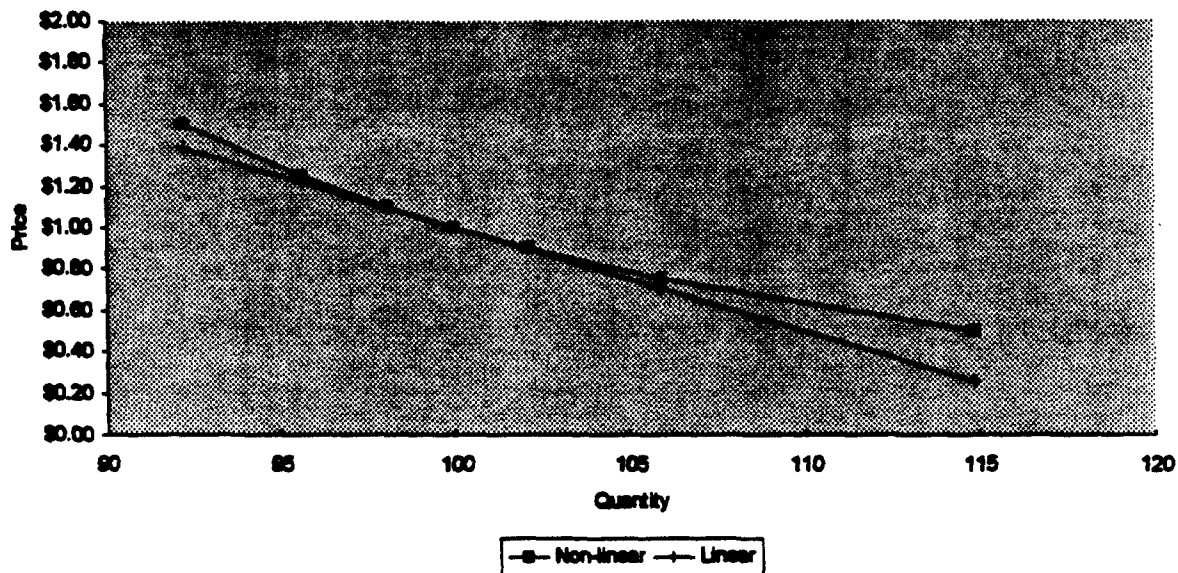
⁹ In the models presented below, a lag structure is used for the price variable. In particular, $\log p_t = w_0 \log p_t + w_1 \log p_{(t-1)} + \dots + w_T \log p_{(t-T)}$, where T is the number of lags, i.e., the number of months necessary for the full long-run price effect to occur. In the results presented below, the weights, w, are chosen so that their sum, which is also the coefficient a_2 , equals the long-run price elasticity.

That is, volume has increased by 15 percent with the non-linear curve. In contrast, the linear model produces the following volume growth.

$$\text{Linear: } \frac{\text{New Volume}}{\text{Old Volume}} = 1 + e \left(\frac{\text{New Price}}{\text{Old Price}} - 1 \right) = 1 + (-0.2) (0.5 - 1) = 1.1$$

Note that volume is only 10 percent greater with the linear model.

Figure 1: Linear and Non-Linear Demand Models



Q. Please describe the results of your toll demand study.

A. Table 1 (at the end of my testimony) lists the demand equation. The following findings are noteworthy.

- The long-run price elasticity for toll services is -0.20 and is highly statistically significant. The precision with which the elasticity is estimated is shown by how large the coefficient of log(Real Price) is relative to its standard error (which is a measure of how far the estimated coefficient deviates from the correct elasticity). The standard error for the price coefficient is 0.031. Because the price coefficient (-0.20) is about seven times its standard error, it is (1) a precise estimate and (2) not equal to zero with a high degree of confidence. That is, Pacific's customers increase toll

calling in response to price decreases and the amount of the increase can be precisely determined by an elasticity of -0.20.

- The statistically significant income elasticity of 0.75 is well within the range reported in recent toll demand studies.¹⁰
- A number of the monthly indicator variables show significant seasonal variation. In particular, relative to December, volumes tend to be higher in January, March, and August and lower in February.¹¹

Q. Have you tested the reasonableness of your price elasticity estimate?

A. Yes. I compared pre- and post-IRD demand volumes in a way analogous to measuring the impact of a controlled experiment. In particular, 1996 volumes are 19.8 percent higher, on average, than 1994 (pre-IRD) volumes and these volumes represent the full long run impact of the IRD price change.¹² Only part of this impact is attributable to the price reduction. In particular, a very conservative estimate of the effect of other factors is the 2 percent per year pre-IRD volume growth.¹³ This adjustment lowers the post-IRD demand growth to 15.8 percent (19.8% - 2 x 2%). The corresponding change in the real toll price is a 47 percent reduction.¹⁴ Given these changes, an alternative estimate of the price elasticity is given by the following equation.

$$e = \frac{\log (1 + \% \text{ change in volume})}{\log (1 + \% \text{ change in price})}$$

¹⁰ Lester D. Taylor, *Telecommunication Demand in Theory and Practice*, Boston: Kluwer, 1994, Chapter 6.

¹¹ Because the pattern of seasonal variation is significant, including the monthly variables makes the model more precise by removing seasonal variation from the estimation of the elasticity.

¹² Attachment 2 describes how a diffusion model can be used to test whether the demand growth has reached a steady state. In fact, the 1996 average growth percentage is very close to the steady state estimate from a diffusion model. February growth is adjusted to account for the extra day in the leap year.

¹³ This estimate is conservative because the California economy is much stronger now than it was prior to the IRD price reduction. That is, if a higher adjustment for the effect of other factors were used, the elasticity derived by this method would be smaller in magnitude.

¹⁴ This reduction consists of the 44 percent toll price reduction in price from the IRD decision (see Attachment 2), augmented by (1) the approximately 1.5 percent surcredit still in place and (2) the small amount of inflation between 1994 and the present.

1 Using the 15.8 percent increase in volume and the 47 percent decrease in price in the
2 above equation produces an elasticity estimate of -0.23.

3 Q. Is the elasticity you just described as valid as the one based on your demand model?

4 A. No. The estimate based on my demand model includes a more rigorous statistical
5 control for non-price determinants of demand. The simpler calculation I just described
6 was an attempt to emulate these controls in a more transparent manner. Accordingly, I
7 view the two results as being quite close, with the latter value serving to corroborate the
8 -0.20 estimate from the more rigorous demand model.

9 Q. Is there any other test of the validity of your elasticity estimate?

10 A. Yes. The toll elasticities Professor Jerry Hausman presented to this Commission in the
11 IRD proceeding translate into a nonlinear price elasticity of -0.20. Because Professor
12 Hausman's results were based on completely independent data and different econometric
13 techniques, the closeness of the respective results is strong mutual corroboration of the
14 elasticities from the pre-IRD and post-IRD studies.

15
16 **III. SWITCHED ACCESS DEMAND STUDY**

17 Q. Please describe the data you used to study switched access demand.

18 A. I used monthly data on intrastate switched access volumes (local switching minutes), real
19 personal income, and switched access prices. I used the same period of January 1992 to
20 September 1996 for my demand model. The particular variables were as follows.¹⁵

- 21 • Volume: For 1992 to 1994, Pacific's intrastate switched access volumes. For the
22 post-IRD period (1995 and 1996), these volumes were reduced to exclude the
23 intraLATA toll volumes of other carriers, as measured by intraLATA 10XXX
24 switched access volumes.¹⁶

¹⁵ I also tested a model with monthly indicator variables. These variables generally show little seasonal variation. The inclusion of these variables had almost no effect on the price elasticity estimate.

¹⁶ These volumes were analyzed in the intraLATA toll demand study because they are the result of competitive intraLATA entry, not price stimulation for interLATA toll and access services.

- Price: Pacific provided surcredit-adjusted prices. As is customary in econometric demand studies, price is expressed in real (inflation-adjusted) dollars, by dividing by the same consumer price index used for the toll demand model. Price was entered into the model as a polynomial distributed lag (PDL) to account for the fact that customers require a certain amount of time to respond to a price change.¹⁷
- Real Personal Income: To account for changes in the strength of California's economy, I used the same measure of real personal income for the 1992 to 1996 period that I included in the toll demand model.

Q. Does your switched access model employ the non-linear formula?

A. Yes. Again to be consistent with the formula used in the IRD Decision, I estimated the following equation.

$$\log(\text{volume}) = a_0 + a_1 \log(\text{Income}) + a_2 \log(\text{price})$$

In the equation, the coefficient of the income variable (a_1) is the income elasticity and the coefficient of the price variable (a_2) is the price elasticity.

Q. Please describe the results of your switched access study.

A. Table 2 lists the demand equation. The following findings are noteworthy.

- The long-run price elasticity is -0.24 and is highly statistically significant—precisely estimated and clearly different from zero.
- The statistically significant income elasticity of 0.96 is well within the range reported in previous toll demand studies.¹⁸

Q. Have you tested the reasonableness of your price elasticity estimate?

A. Yes. I compared pre- and post-IRD demand volumes in a way analogous to measuring the impact of a controlled experiment. In particular, 1996 switched access volumes are 22.9 percent higher, on average, than 1994 (pre-IRD) volumes and these volumes represent the full long run impact of the IRD price change.¹⁹ Only part of this impact is

¹⁷ The same lag structure that was used for the intraLATA toll model was employed here.

¹⁸ Because the demand for switched access is derived from the end-user demand for interLATA toll, a toll income elasticity is a relevant benchmark.

¹⁹ Again, a diffusion model confirms that the 1996 average growth is close to the steady state demand growth.

1 attributable to the price reduction. In particular, a very conservative estimate of the
2 effect of other factors is the 6 percent per year pre-IRD volume growth.²⁰ This
3 adjustment lowers the post-IRD demand growth to 10.9 percent (22.9% - 2 x 6%). The
4 corresponding change in the real switched access price is a 51 percent reduction.²¹
5 Given these changes, an alternative estimate of the price elasticity is given by the
6 following equation.

$$7 \quad e = \frac{\log(1 + \% \text{ change in volume})}{\log(1 + \% \text{ change in price})}$$

8 Using the 10.9 percent increase in volume and the 51 percent decrease in price in the
9 above equation produces an elasticity estimate of -0.15.

10 Q. Is the elasticity calculation you just described as equally valid as the one based on your
11 demand model?

12 A. No. The estimate from my demand model is based on more rigorous statistical
13 control for non-price determinants of demand. The simpler calculation I just described
14 was an attempt to emulate these controls in a more transparent manner. Accordingly, I
15 view the two results as being reasonably close, with the latter value serving to
16 corroborate the more conservative -0.24 estimate from the more rigorous demand
17 model.

18 Q. Is there any other test of the validity of your elasticity?

19 A. Yes. The switched access elasticity Professor Jerry Hausman presented to this
20 Commission in the IRD proceedings was a nonlinear price elasticity of -0.16. Because
21 Professor Hausman's results were based on completely independent data and somewhat
22 different econometric techniques, the closeness of the respective results provide mutual
23 corroboration of the elasticities from the pre-IRD and post-IRD studies.²²

²⁰ The estimate is conservative because the California economy is much stronger now than it was prior to the IRD price reduction.

²¹ This reduction consists of the 48 percent reduction in price from the IRD decision, which is described in Attachment 2, augmented by (1) the approximately 1.8 percent surcredit still in place and (2) the small amount of inflation between 1994 and the present.

²² The model presented here differs from Professor Hausman's model because Professor Hausman used a second-order (quadratic) lag structure for price in contrast to the linear lag structure I employed. In fact, when I tested a quadratic lag, an elasticity of -0.19 resulted, which is quite close to Professor Hausman's result. Another

IV. REDUCING TOLL PRICES MORE THAN ACCESS PRICES WILL BENEFIT CONSUMERS AND PROMOTE EFFICIENT COMPETITION

Q. Do current toll prices exceed their incremental costs to a greater extent than switched access prices?

A. Definitely. Even after the substantial IRD price reductions, intraLATA toll prices average \$0.082 per minute, which is many times higher than incremental cost. In contrast, switched access charges for the same calls carried by Pacific's competitors are only \$0.029 per minute. This difference in current rates greatly exceeds the corresponding difference in costs. Therefore, Pacific's toll rates include a much higher level of contribution than the rates charged to competitors for use of the input.

Q. Does this discrepancy in contribution levels distort competition?

A. Yes, in two ways. First, Pacific's relatively high toll prices may serve as a price umbrella. Historically, interexchange carriers have tended not to reduce prices when markets were not sufficiently competitive. Indeed, as Mr. Warner describes, when switched access prices were reduced as a result of the IRD Decision, the major interexchange carriers did not reduce their in-state interLATA rates by as much as the access price decrease. Reductions in Pacific's toll prices will provide considerable benefit to consumers that have not necessarily been forthcoming when competing carriers have enjoyed access price reductions.

Q. How large are the benefits from toll reductions?

A. As I understand it, Pacific anticipates toll reductions of about \$300 million to offset the revenue generated by universal service funding. Because this reduction will stimulate additional calling, consumers benefit not only from the reduction in price for the calls they currently make, but also from the value provided by these extra calls.

Q. Please describe the other competitive problem.

a linear structure, two-thirds of the long-run response occurs in the first year, compared to 50% for the quadratic structure.

1 A. Different mark-ups on essential inputs and retail prices are equivalent to assessing
2 different tax rates on different competitors. In fact, retaining the present differential in
3 contribution levels suffers from the same deficiencies possessed by proposals to price
4 inputs at cost. In particular, to the extent that Pacific is required to recover its shared
5 and common costs predominantly or exclusively in its retail rates while competitors are
6 relieved of this responsibility, serious distortions in competitive outcomes can occur.

7 Q. Please explain.

8 A. Mark-ups in the prices of inputs and retail services are needed to recover the fixed costs
9 shared between producing the incumbent's retail service and the input. The question
10 here is how to establish efficient mark-ups just sufficient to recover the incumbent's
11 shared fixed costs. The economically efficient solution is for such mark-ups to leave
12 unchanged the relative market outcomes that would occur if mark-ups were
13 unnecessary.²³ Equaling the mark-ups assessed to the services of both entrants and
14 incumbents satisfies this efficiency requirement. Retaining the current large discrepancy
15 in contribution levels does not.

16 Q. Please provide an example of how pricing inputs at a lower contribution level can lead to
17 inefficient competition and entry.

18 A. Suppose an essential input is priced at \$0.02 per minute and has a cost of \$0.01. The
19 cost of the non-essential input is \$0.015 for both the incumbent and entrant. The source
20 of the mark-up in this example is an amount of fixed cost, say \$100, that only goes away
21 if the incumbent ceases production of both the essential input and its retail product.
22 Assume that Pacific must charge more than \$0.035 per minute for its retail service, i.e., a
23 higher level of contribution is contained in the retail rate.

24 In this case, the entrant would be able to sell its product for as low as \$0.035 per
25 minute [$\$0.02$ (essential input priced at cost plus \$0.01 of contribution) + \$0.015].
26 However, the incumbent, which is equally efficient in this example, would have to set a
27 retail price higher than \$0.035 in order to fully recover its fixed costs. This is an

²³ F.P. Ramsey, "A Contribution to the Theory of Taxation," *Economic Journal*, March 1927, pp. 47-61.

1 *anticompetitive* situation, because firms that would impose the same costs on society are
2 not in a position to charge the same price. And, to the extent that the entrant were less
3 efficient than the incumbent, its evasion of an equitable recovery of the fixed costs may
4 allow it to prosper, as the incumbent must include an artificially high mark-up in its retail
5 prices in order to be made whole.

6 Q. Could the incumbent's retail service be driven out of the market?

7 A. In this example, such an outcome is entirely plausible. The entrant could undercut all
8 attempts by the incumbent to mark-up its retail price beyond \$0.035 per minute. And if
9 the incumbent's retail operation were excluded from the market in this fashion, the
10 resulting situation is interesting. For the surviving operation—production of the
11 essential input—the incremental cost would now absorb the fixed cost that was formerly
12 shared. In order for the incumbent to recover its total cost, the price of the essential
13 input (the only product now sold), would have to increase.

14 Q. Your example was hypothetical. What are the current circumstances for toll and
15 switched access?

16 A. Earlier I reported that while Pacific's toll price averages \$0.082 per minute, access prices
17 are only \$0.029 per minute for competitors carrying the same calls. Because the
18 additional costs that IXCs incur are only about \$0.01 to \$0.02 per minute (or perhaps
19 even lower), they can offer service for \$0.04 to \$0.05 per minute (or lower), which is
20 well below Pacific's average price. That price, in turn is considerably larger than
21 Pacific's cost of providing its toll services.

22 Q. Your example is quite simple. What happens when competition takes place in several
23 markets?

24 A. While obviously there are complications (e.g., the uniform mark-ups that emerge in the
25 single market examples are not likely to be efficient in the multiple market context), the
26 fundamental outcome prevails. So long as there are shared fixed costs in providing
27 essential inputs and one or more retail service, efficient recovery of such forward-looking
28 costs requires mark-ups over incremental cost that do not distort the relative competitive
29 outcomes that would have occurred had such mark-up been unnecessary, i.e., there were

1 no such fixed costs to recover. Clearly, disproportionately large mark-ups on the
2 incumbent's retail services do not meet this fundamental requirement for economic
3 efficiency.

4 Q. Your discussion has focused on contributions that recover shared fixed costs. Are there
5 any other considerations?

6 A. Yes. Traditionally, contribution in toll and switched access has provided subsidies for
7 services priced below cost. I understand that the recent universal service decision leaves
8 some of Pacific's basic service prices below cost. Competitively neutral mark-ups in the
9 prices of toll and switched access to fund this remaining cross subsidy are just as
10 legitimate as mark-ups to recover fixed shared costs.

11 Q. Does this complete your testimony?

12 A. Yes.